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96-RF-06715

Draft Corrective Action Management Unit (CAMU) Interim Measure/Interim Remedial Action (IM/IRA) Decision Document and Application Support Document for Containerized Storage

Environmental Restoration
Rocky Flats Environmental Technology Site

November 25, 1996

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Draft
Corrective Action Management Unit
Interim Measure/Interim Remedial Action
Decision Document and Application Support
Document for Containerized Storage

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ABBREVIATIONS AND ACRONYMS

ALARA	As Low As Reasonably Achievable
CAMU	Corrective Action Management Unit
CCR	Code of Colorado Regulations
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHWA	Colorado Hazardous Waste Act
CSF	Containerized Storage Facility
cy	cubic yards
Decision Document	Interim Measure/Interim Remedial Action Decision Document
DOE	United States Department of Energy
ER	Environmental Restoration
ERDA	Energy Research and Development Administration
ft	feet or foot
PPE	Personal Protective Equipment
HW	Hazardous Waste
IA	Industrial Area
IA-East	Industrial Area-East
IA-West	Industrial Area-West
IDM	Investigation-Derived Material
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
in.	inch or inches
nCi/g	nanocuries per gram
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NTS	Nevada Test Site
OU	Operable Unit
QA/QC	Quality Assurance/Quality Control
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
pCi	Picocuries
PPRG	Programmatic Preliminary Remediation Goals
Pu	Plutonium
RCRA	Resource Conservation and Recovery Act

RFCA	Rocky Flats Cleanup Agreement
RWSF	Remediation Waste Storage Facility
SE Quad	Southeast Quadrant
Site	Rocky Flats Environmental Technology Site
Site Vision	Rocky Flats Conceptual Vision
SW Quad	Southwest Quadrant
TCE	Trichloroethene
U.S.	United States
WAC	Waste Acceptance Criteria

EXECUTIVE SUMMARY

The Department of Energy is requesting that the State of Colorado designate a Corrective Action Management Unit (CAMU) for containerized storage of remediation wastes at the Rocky Flats Environmental Technology (RFETS). This facility would be known as the Containerized Storage Facility (CSF). This CSF CAMU designation is being requested as an option to facilitate risk reduction activities in support of site closure at RFETS and to compliment the CAMU designation request for a bulk storage facility already submitted to the Colorado Department of Health and Environment (CDPHE). This CSF CAMU designation would serve as additional contingency in the event assumptions in the Draft Ten Year Plan (DOE 1996a) regarding offsite disposal capabilities prove to be invalid and onsite storage capabilities are necessary to facilitate risk reduction.

The lack of complete site characterization data for RFETS environmental media and decommissioning waste results in significant data gaps that impact waste volume estimates. Current volume estimates range from approximately 54,000 cubic meters to over 300,000 cubic meters. These uncertainties with respect to waste volume estimates, as well as the unknown future availability of offsite disposal facilities underscore a need for a flexible waste management strategy in order to achieve cost effective and timely site closure. In addition to remediation waste storage, the CSF would also serve as a staging facility to support offsite shipment of the remediation waste.

This CAMU designation request for the CSF is presented as an Interim Measures/Interim Remedial Action (IM/IRA) Decision Document and Application Support Document. The CSF would support a cost-effective, flexible, and achievable remediation waste management strategy for RFETS. The overall objective of this designation request is to provide a proposed alternative and rationale that supports the goals of the Rocky Flats Cleanup Agreement (RFCA DOE 1996b) and Draft Ten Year Plan. The CSF CAMU would support the RFCA goal (Preamble, B2(a)) of initially controlling sources of contamination as a priority over offsite shipment. The CSF CAMU would allow early cleanup to proceed by providing interim onsite storage for remediation wastes in the event offsite shipment is delayed. The CSF would store waste not amenable for bulk storage, or waste ready to ship in the near-term to an available offsite disposal or treatment facility.

Only remediation wastes would be managed in this facility. Remediation waste types include contaminated soil collected from cleanup actions, treated and untreated sludge and sediments, Toxic Substance Control Act (TSCA) waste, such as asbestos and Polychlorinated Biphenyls (PCBs), treatment by-products from groundwater, surface water, and/or soil remedial actions, investigation-derived materials (IDM) and contaminated building decommissioning debris. It is the intent of DOE

to request a CSF CAMU for storage only. The request that CDPHE make a finding of fact as to whether the proposed facility also meets the requirements for a disposal facility, as described in paragraph 80 of the RFCA, is deferred. A determination has not been made on the period of operation of the CSF CAMU. Closure of the facility would be in accordance with cleanup levels established in the RFCA.

This decision document details how the CSF CAMU designation supports risk reduction and eventual site closure in the following ways:

- The CSF CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies. This would be implemented in accordance with the requirements of the RFCA, as a contingency to support the schedule detailed in the Draft Ten Year Plan.
- The CSF CAMU designation would support a flexible waste management strategy that emphasizes near-term offsite remediation waste disposal, as emphasized in the Draft Ten Year Plan, while recognizing the uncertainties associated with current remediation waste volume estimates and the timely availability of offsite disposal locations.
- The CSF CAMU would focus resources on immediate risk reduction by facilitating actual cleanup and source removal and deferring treatment not necessary to protect human health or the environment.
- The CSF CAMU would allow DOE to achieve economies of scale by consolidating remediation waste, making treatment and offsite disposal less costly and addressing long-term liability and safety issues.

This document demonstrates how the CSF meets all regulatory requirements for CSF CAMU designation by the CDPHE and supports the selected location and design concepts. It also contains preliminary waste acceptance criteria, closure requirements, a timeline and a discussion of National Environmental Policy Act (NEPA) values.

Based on the waste management objectives of the RFCA and Draft Ten Year Plan, the best approach for an interim storage CSF CAMU was determined to be a metal building, e.g., a "Butler" type building, which would be constructed upon a concrete pad. The CSF CAMU would be located near the existing rail lines in the southwest quadrant of the Industrial Area. The design would incorporate features compliant with the Resource Conservation and Recovery Act (RCRA) Subtitle "C" requirements, as stated in the Code of Colorado Regulations (CCR) 6 CCR 1007-3, Part 264

Subpart N and required in Paragraph 80 of the RFCA. The facility would consist of a maximum of four separate structures. Each structure would be able to store up to 25,000 cubic yards of remediation waste contained in "rolloff" type containers for a maximum capacity of 100,000 cubic yards.

1. INTRODUCTION

This is an application for designation of the proposed Containerized Storage Facility (CSF) as a Resource Conservation and Recovery Act (RCRA) Corrective Action management Unit (CAMU) and a Rocky Flats Cleanup Agreement (RFCA) Decision Document. This Decision Document provides the United States Department of Energy's (DOE) technical justification and decision-making process for the option of siting and construction of a CSF for storage of remediation waste including decommissioning wastes, at the Rocky Flats Environmental Technology Site (RFETS) (Figure 1-1). The CSF CAMU designation is available as a regulatory alternative to facilitate the implementation of reliable, effective, protective, and cost-effective remedies.

The CAMU designation of a CSF is a necessary contingency to achieve the targeted ten-year cleanup goal that includes an aggressive schedule for near-term offsite shipment. The need for both a bulk storage CAMU facility as well as the CSF is dependent on the waste volumes generated during Environmental Restoration (ER) and Decommissioning activities. The estimated volumes are uncertain because characterization is not yet complete for the Industrial Area (IA). Final disposal sites will be dependent on waste volumes and contaminant characteristics, which have not yet been determined, and may not be available on an as needed basis to support RFETS cleanup. In addition, the overall process of offsite shipment and disposal may not be able to keep up with waste volume generation, thus, impacting risk reduction capabilities. The flexibility provided by the CSF contingency enhances DOE's ability to ensure timely and cost-effective site closure in support of the aggressive offsite waste shipment strategy embodied in the Site Draft Ten Year Plan (DOE 1996a).

This CSF CAMU designation will be used along with a separate bulk storage CAMU designation to provide a range of options for waste management. The specific options used will depend on several factors, or uncertainties, as described above. In general, both CAMUs are intended to support two different needs at RFETS; bulk storage and containerized storage. Bulk storage considerations include:

- Ease of management of large volumes of remediation waste;
- Storage of waste for a period of several years (5 to 20) for logistical or budgetary reasons or to achieve economies of scale for treatment or disposal; and
- High cost of containers, and large number required due to the large volumes of waste.

Containerized storage considerations include:

- Remediation waste not amenable to bulk storage, such as types of metal building debris;
- Near-term offsite shipment within approximately one year; and
- Areas where very small volumes of waste are generated and bulk removal is not efficient or necessary.

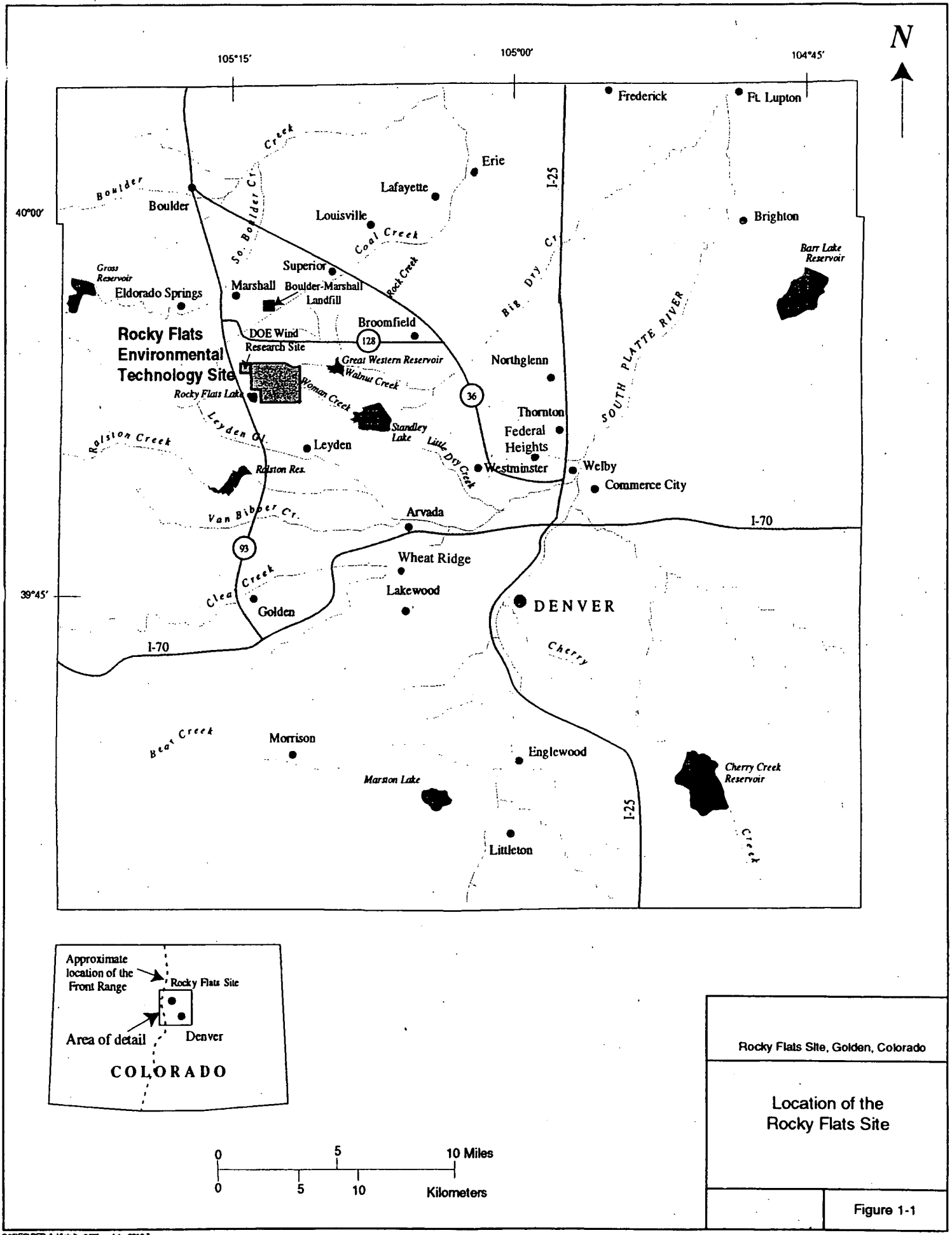
The designation of the CSF as a CAMU provides an option for quick and effective handling of a larger volume of waste in a safer manner than the conventional RCRA approach allows. Instead of managing waste from each contaminated area individually, the CSF CAMU contingency allows for remediation waste to be brought to one centralized facility for storage and preparation for offsite shipment, treatment, and disposal.

The type of wastes to be managed in the facility would consist of low-level, low-level mixed, and TSCA hazardous remediation waste which is not amenable to bulk handling and storage or not desirable for bulk storage since near term offsite shipment is planned. RFCA paragraph 5, definition b.f. states:

" Remediation waste includes:
(1) solid, hazardous, and mixed wastes;
(2) all media and debris that contain hazardous substances, listed hazardous or mixed wastes or that exhibit a hazardous characteristic; and
(3) all hazardous substances generated from activities regulated under this Agreement as RCRA corrective actions or CERCLA response actions, including decommissioning."

Remediation waste does not include wastes generated from non-ER or decommissioning activities. Nothing in this definition confers RCRA or CHWA authority over source, special nuclear, or byproduct material as those terms are defined in the Atomic Energy Act.

The total waste volume estimate currently listed in the Draft Ten Year Plan for remediation wastes is 123,000 cu yd.



Rocky Flats Site, Golden, Colorado

Location of the Rocky Flats Site

Figure 1-1

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This Decision Document contains the information necessary for the Colorado Department of Public Health and Environment (CDPHE) to designate a CSF used for containerized storage. This CAMU designation by the CDPHE is required so that the CSF can be included as a regulated unit at the RFETS. By having a CSF CAMU designation, the DOE can meet the waste management objectives consistent with the recently signed RFCA (DOE, 1996b). With the schedules proposed in the Draft Ten Year Plan, the flexibility provided by the CSF CAMU approach will provide contingency for facilitation of RFETS cleanup.

In addition to RFCA, the Draft Ten Year Plan has been developed to describe how accelerated cleanup and closure of RFETS would be achieved. The Draft Ten Year Plan addresses the management of remediation waste without a CSF CAMU. Included in the Draft Ten Year Plan, as Major Decision 4, are assumptions for waste storage and offsite disposal capabilities. The CSF CAMU designation is a contingency in the event a waste storage alternative is needed to support accelerated cleanup of the RFETS if offsite shipment of remediation waste cannot meet waste generation demands.

The CSF CAMU area is proposed to be located within the Industrial Area in the southwestern quadrant. The CSF would consist of metal storage buildings with sealed concrete floors and would be constructed to store containerized remediation waste. The facility would be modular in design and consist of several buildings so that facility size can be adjusted according to need. The facility is intended to support storage of up to 100,000 cubic yards of waste stored in 20 cubic yard "rolloff"-type top loading containers.

It is the intent of the DOE to request a CSF CAMU for storage only, and that all waste would be removed from the CSF prior to Site closure. The request that CDPHE make a finding of fact as to whether the proposed facility also meets the requirements for a disposal facility, as described in Paragraph 80 of the RFCA, is deferred.

1.1 DECISION DOCUMENT ORGANIZATION

This document is divided into six sections and is structured to provide the information required to support the technical justification for a CSF CAMU designation in sequence. This includes the following:

- Section 1.0.

- Section 2.0 identifies the need for a CSF CAMU based upon the criteria defined in 6 CCR 1007-3 Part 264 subpart S.
- Section 3.0 identifies the additional requirements, included in RFCA Paragraphs 80 and 109, that a CSF CAMU at RFETS would need to meet.
- Section 4.0 is a discussion of the alternatives considered for the CSF.
- Section 5.0 which is a description of the recommended design and a discussion of how the design meets the previously identified criteria. This section also includes facility specific details such as waste characteristics, waste acceptance criteria, and closure requirements.
- Section 6.0 is the proposed CSF Schedule.
- Section 7.0 lists references cited in the document.

1.2 CSF CAMU DECISION DOCUMENT SCOPE AND OBJECTIVES

The following two sections discuss the scope and objectives for this Decision Document.

1.2.1 Scope Description

The scope of this document includes the following sequential decision process: first, this document identifies a need for a CSF CAMU designation for containerized waste storage; second, this document identifies the requirements a CSF CAMU at RFETS would need to satisfy; and third, this document describes the recommended CSF alternative and how it meets the requirements identified above. The following facility-specific issues are described:

- Waste characteristics and source volume estimates;
- Conceptual waste acceptance criteria (WAC);
- General design requirements; and
- General monitoring requirements.

Pretreatment requirements of remediation waste, other than the general requirements included as part of the WAC, are not included in the scope of this document except for the purpose of cost estimating. The reason for this approach is that pretreatment is very specific to an individual action

and specific waste types. Pending changes within the regulatory environment such as the proposed Hazardous Waste Identification Rule (HWIR), area-specific cleanup levels based upon future land use agreed to in the RFCA may influence treatment requirements on an action specific basis. The pretreatment discussion for each accelerated cleanup action will be included in the project-specific Proposed Action Memorandum, Interim Measures/Interim Remedial Action Decision Documents, and Proposed Plans, or Remedial Action Plans for each specific IHSS, group of IHSS or building; allowing treatment to be tailored to the specific action.

Specific plans and documents detailing environmental monitoring, waste acceptance criteria, and closure are not in the scope of this document; however, the need for these plans is identified as a requirement under 6 CCR 1007-3 264.552. The approval process for a CSF CAMU is a three-step process as follows:

1. The first step is the IM/IRA Concept Validation/CAMU Designation, which consists of this IM/IRA Decision Document;

2. The second step is Design/Preparation for Construction, which consists of Title II design, Groundwater Monitoring Plan, Construction Quality Assurance Plan, Test Fill Plan, and Closure Plan preparation.

3. The third step, Construction/Preparation for Operations, will include Inspection, Operation, Waste Acceptance, Emergency, and Security Plans.

All phases would have State and public input with final State approval.

1.2.2 Decision Document Objectives

In order to meet the primary objective of designating a CSF CAMU, this document provides information on how a CSF CAMU at RFETS meets each of the seven decision criterion identified in the CSF CAMU regulations (6 CCR 1007-3, Part 264, Subpart S) as well as requirements defined in RFCA. This document also addresses how this facility would support the overall RFETS cleanup strategy described in the Draft Ten Year Plan.

The supporting objectives which lead to the determination that a CSF CAMU option is necessary include the following:

- In support of the RFCA and the Draft Ten Year Plan, the management of low-level, low-level mixed, TSCA, and hazardous remediation waste must ensure the safety of the public, RFETS workers, and the environment through reliable, effective, protective, and cost-effective management of remediation wastes at the RFETS.

- The solution must support a flexible waste management policy combining contingencies for both long-term storage and shorter term staging/storage for offsite disposal as necessary. The solution must recognize the uncertainties surrounding waste volume estimates, future offsite disposal availability, and final disposal locations. A flexible policy would ensure that the most timely and cost-effective strategy that supports RFCA and Draft Ten Year Plan objectives can be implemented.

- The management of low-level, low-level mixed, and hazardous remediation waste must result in a cost-effective solution that supports RFETS closure schedules.

- A means of consolidating remediation waste in one location must support near-term risk reduction and offsite waste shipment goals while addressing long-term liability and safety issues and remaining compatible with future land uses for the RFETS.

1.2.3 Site Justification for Designation

There are several considerations specific to RFETS that support the need for a CSF CAMU. The primary reason is to support timely risk reduction by providing an option that allows risk reduction to occur without slowdowns or impacts to cleanup capabilities. These considerations include:

- Cleanup of RFETS under the Ten Year Plan is completed within a much shorter time frame than previously considered. The Draft Ten Year Plan assumes:

  — all low-level and low-level mixed wastes will be shipped offsite for disposal;

  — low-level and low-level mixed waste generated in excess of shipping capacity will be managed in new onsite facilities; and

  — when ER and Decommissioning activities begin in earnest, storage facilities will be available to support remediation operations.

- The objective listed in the RFCA Section (B)(2)(a) states "Initially controlling the sources of contamination will take priority over offsite waste shipments to maximize risk reduction".
- Placement of remediation waste in existing permitted units is limited due to of a lack of storage capacity.
- Unresolved uncertainties associated with the waste volume estimates and timely offsite disposal availability for remediation wastes create a need for a flexible waste management strategy that incorporates a CSF CAMU designated CSF contingency.

1.3 SITE DESCRIPTION

The RFETS is a government-owned, contractor-operated facility, that is part of the nationwide Nuclear Weapons Complex. The Rocky Flats Environmental Technology Site (RFETS) was operated for the United States Atomic Energy Commission from its inception in 1951 until the it was dissolved in January 1975. At that time, responsibility for RFETS was assigned to the Energy Research and Development Administration (ERDA), which was succeeded by DOE in 1977.

From 1953 through 1989, RFETS was used to produce components for nuclear weapons from materials such as plutonium, uranium, beryllium, and various alloys of stainless steel. Non-nuclear production continued through 1995 in Building 460. Additional plant missions included plutonium recovery and reprocessing, and waste management. Production activities included metal fabrication and assembly, chemical recovery and purification of process-produced transuranic radionuclides. The consequence of these various activities over nearly 40 years was the contamination of some of RFETS soils, groundwater, buildings, process pipelines, and associated waste management equipment.

The Rocky Flats Environmental Technology Site (RFETS) is located in northern Jefferson County, Colorado, approximately 16 miles northwest of Denver (see Figure 1-1). Boulder to the northwest, Broomfield and Superior to the northeast, Westminster to the east, and Arvada to the southeast, are all located within 10 miles of RFETS. RFETS consists of approximately 6,550 acres with most of the structures located within a central "protected area" of approximately 400 acres.

The majority of residential development within five miles of RFETS is located immediately northeast, east, and southeast of RFETS. Commercial development is concentrated near residential developments north and southwest of Standley Lake as well as around Jefferson County Airport, approximately three miles northeast of RFETS. Industrial land use within five miles of RFETS currently includes quarrying and mining operations. Open space lands are located northeast of

RFETS, near the City of Broomfield, in small parcels adjoining major drainages and in small neighborhood parks in the cities of Westminster and Arvada. The west, north, and east sides of Standley Lake are encompassed by Standley Lake Park open space. Irrigated and non-irrigated croplands, producing primarily wheat and barley, are located north and northeast of RFETS near the cities of Superior, Broomfield, Lafayette, Louisville, Boulder, and in scattered parcels adjacent to the eastern boundary of RFETS. Several horse operations and small hay fields are located south of RFETS. Future land use in the vicinity of RFETS could involve continued urban expansion, increasing the density of residential, commercial, and industrial land use in the area.

2. VERIFICATION OF CSF CAMU DESIGNATION CRITERIA

The ability to designate the CSF as a CSF CAMU is dependent on compliance with the criteria found in 6 CCR 1007-3 264.552 (c), Corrective Active Management Units. In order to demonstrate a need for a CSF CAMU at RFETS, these seven criteria were made an integral part of the decision-making process. Each of the seven CSF CAMU criteria listed below as numbers 1 through 7 is followed by a description of how the selected CSF remedy demonstrates compliance with the criterion.

1) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies (264.552 [c] [i]).

The CSF would ensure that RFETS can facilitate the implementation of reliable, effective, protective, and cost-effective remedies by:

The CSF CAMU provides reliability and effectiveness by allowing cleanup to continue in the event offsite disposal capabilities cannot support waste generation needs. This allows contaminant sources to be removed sooner rather than remain exposed in the environment because no storage or the offsite shipment is available.

The CSF CAMU would be protective by supporting timely removal of contaminant sources from the environment, reducing risk to human health and the environment.

This CAMU is cost effective from both location and design standpoints. This location provides a single location for storage and shipment since it is close to the RFETS rails spur and it has fewer security restrictions than other areas at RFETS. This reduces overall handling, inspection, and shipment costs. The design includes containment, retrievability, and inspection features which ensures that the facility is protective of human health and the environment.

2) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposures to hazardous waste or hazardous waste constituents (264.552[c][2]).

A CSF CAMU would not create unacceptable risks and eliminates potential risks that might be associated with alternative storage options, or leaving waste sources exposed in the environment because offsite disposal is not available. The CSF CAMU minimizes risks to human health and the environment in the following ways:

- Remediation waste removed from the environment would be put into an effective and protective facility. Contaminant sources would not be exposed to natural transport phenomena that could spread the contamination.

- Safety precautions would be taken during construction of the facility. All activities would be performed within the safety and radiological protection standards that exist at RFETS. Individuals with expertise specific to construction safety would ensure that construction activities are carried out in a safe manner. Construction quality assurance efforts would ensure that the CSF would meet all design criteria and performance standards for protectiveness.

- Onsite transportation of the wastes would be performed in a controlled environment over short distances on non-public roads with minimal or controlled traffic. Operations would be closely monitored and safely controlled. Because the distances would be short and the process would be tightly controlled, the risk of transportation accidents would be minimized. Administrative and engineered controls would be used to ensure that high winds do not mobilize the contamination during packaging or transporting. These measures may include precautions such as covered loads, spraying water or other dust suppressants on the loads, high wind shut downs, and other appropriate precautions. Final shipping and offsite disposition of the wastes would be conducted once cleanup is complete, allowing resources to be more efficiently focused, economies of scale to be achieved, and support operations to be appropriately scaled.

- Indirect effects and cumulative impacts of the ER and decommissioning programs at RFETS would be reduced by utilizing the centralized CSF, and disposing of all low-level and low-level mixed remediation wastes in offsite permitted facilities. Impacts to the environment would be minimized because the footprint of contaminated areas would be reduced to one facility compared to multiple IHSSs that now exist, and the CSF would be

constructed in areas that have already been disturbed, and thus will not impact previously undisturbed areas of RFETS.

3) The CAMU shall include uncontaminated areas of the facility, only if including such areas for the purposes of managing remediation waste is more protective than management of such wastes at contaminated areas of the facility (264.552 [c][3]).

The proposed area is not within an IHSS or thought to be an area of major contamination. Still, this site was selected for the following reasons.

- The area is near the RFETS rail spur and other offsite shipment facilities. This location reduces the waste handling requirements and enhances the ease of offsite shipment, thereby reducing potential exposure to RFETS workers and enhancing ease of shipment.

- The area is relatively free of obstructions such as buildings, utilities, and process waste lines which facilitates more rapid construction.

- The area is not within the Protected Area. This location, therefore, enhances the ease of use of the facility and reduces potential exposure to workers during waste transport. Waste transportation, inspection and handling requirements are less for areas outside the PA due to security restrictions. This reduces risk to workers.

- The area is within a previously disturbed industrial setting which limits the impacts to natural resources, endangered species habitat, and the environment.

- The area is relatively isolated from other areas of the site and it is not near major building clusters or environmental restoration sites. This offers some degree of additional protectiveness to workers supporting site cleanup tasks.

4) Areas within the CAMU, where remediation wastes remain in place after closure of the CAMU, shall be managed and contained so as to control, minimize, or eliminate future releases to the extent necessary to protect human health and the environment (264.552 [c][4]).

This criterion is not applicable. At this time, the intended use of this facility is for monitored, retrievable waste storage pending offsite disposal.

5) The CAMU shall expedite the timing of remedial activity implementation, unless to do so would be inconsistent with 264.552 (c)(1) or (c)(2). See criteria 1 and 2 above.

This CSF CAMU is intended to be used as a contingency to the strategy in the Ten Year Plan. As previously mentioned, the Ten Year Plan assumes wastes can be shipped and disposed offsite as they are generated. In the event this assumption fails, contaminant sources would either be stored at the point of generation or left exposed to the environment. Both of these would impact risk reduction activities and schedules. Use of this contingency would ensure that the timing of remedial activity implementation would not be impacted. This would allow risk reduction to be conducted in an expedited fashion, as planned in the Ten Year Plan.

6) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of remediation waste that will remain in place after closure (264.552 [c][6]).

Because the proposed CSF would be for storage of containerized waste only, it would not impact or be impacted by the use of treatment technologies. Treatment to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of remediation waste that would remain in place after closure is a key element of the ER program and of all cleanup actions at RFETS. At RFETS, many IHSS source removals would involve treatment by low temperature thermal desorption to remove the hazardous component of low-level mixed-waste. Treated waste that is below the action levels in RFCA would be placed back in the IHSS and would remain in place after closure. This waste minimization and reduction of toxicity and mobility approach results in only shipping offsite disposal wastes that are either above the RFCA action levels for radiological dose, or those from which the hazardous component cannot be removed easily. Decommissioning wastes are not anticipated to need treatment (other than sizing) prior to shipment for offsite disposal.

7) The CAMU shall minimize the land area of the facility upon which remediation wastes will remain in place after closure of the CAMU unless to do so would be inconsistent with 264.552 (c)(1) or (c)(2). See criteria 1 and 2 above.

The intended use of this CAMU is for storage. No remediation waste is intended to be left in place after closure. In addition, the CSF CAMU would support a sitewide bias towards removal rather than isolating sources in place. This would facilitate release of areas at RFETS for future land use, as described in the Preamble to the RFCA.

3. IDENTIFICATION OF SUBSTANTIVE CRITERIA

Paragraph 80 of RFCA provides: "(I)f the application meets the appropriate substantive criteria CDPHE would issue a CSF CAMU designation." Likewise, the CSF CAMU rule, promulgated pursuant to the Colorado Hazardous Waste Act (CHWA), states that "(t)he Department shall specify, in the permit or order, requirements for CSF CAMUs..." (See 6 CCR 1007-3, Part 264.552 (e).

3.1 CSF CAMU OBJECTIVES

The designation of a Corrective Action Management Unit must be performed in accordance with the seven criteria enumerated in 6 CCR 1007-3, Part 264.552(c). Section 2 discusses how the CSF would meet these criteria.

3.2 RFCA REQUIREMENTS

Consistent with RFCA paragraph 80, the following design and operating requirements will be addressed and implemented:

- Double containment (containers and secondary containment integral with concrete slab);
- Waste storage in inspectable containers ready for offsite shipment;
- Spill collection;
- Visual inspection;
- A groundwater monitoring system;
- Corrective action for releases; and
- A waste acceptance criteria, consistent with design and operation, that provides treatment of wastes where necessary.

These requirements for the CSF are discussed in Section 5.4. As part of the IM/IRA process, paragraph 109 of RFCA also directs consideration of seven topics in the alternatives analysis:

- Worker safety;

- Protection of human health and the environment;
- Transportation;
- Facility design, containment, and monitoring;
- Institutional controls;
- Cost; and
- Community acceptance.

These requirements are discussed in the alternatives analysis in Section 4 and are summarized in Table 4-1.

3.3 CAMU Requirements

Paragraph 80 of RFCA provides: "(I)f the application meets the appropriate substantive criteria CDPHE will issue a CAMU designation." Likewise, the CAMU rule, promulgated pursuant to the CHWA, states that: "(t)he Department shall specify, in the permit or order, requirements for CAMUs..." (See 6 CCR 1007-3 Part 264.552 (e).

Additional requirements for designation are enumerated in Part 264.552(e) of the CAMU rule. The following are the additional CAMU requirements:

- Specification of the area configuration, Part 264.552 (e) (1));
- Specification of the design, operation, closure, and post-closure requirements (Part 264.532 (e) (2); and
- Specification of groundwater monitoring requirements (Part 264.552 (e) (3).

If implementation of this CSF CAMU becomes necessary to meet risk reduction goals, documentation and plans meeting the above requirements will be provided during the CSF design/preparation for construction phase.

4. ANALYSIS OF ALTERNATIVES AND SELECTION BASIS

As stated in Section 3 above, RFCA paragraph 109 requires that the IM/IRA present an analysis of alternatives as part of the CAMU designation process.

A variety of alternatives were considered ranging from No Action to highly engineered storage vaults. Four alternatives were selected to represent the spectrum of technologies available. These alternatives serve as a contingency to the Draft Ten Year Plan should waste volume, storage, or shipping assumptions in the Draft Ten Year Plan prove invalid. These four alternatives are:

- No-Action - Remediation waste would be treated and shipped to an offsite disposal facility as soon as it is generated, or would remain in storage in containers at the point of generation, or cleanup would be delayed until removal and shipment would be possible.
- Slab on Grade - Waste is stored in cargo containers placed on an above grade concrete slab; Secondary containment would be built into the slab. The facility would have no roof or walls.
- Metal Buildings - Waste would be enclosed in containers placed inside engineered metal buildings on concrete slabs; Secondary containment would be built into the floor slabs. This is current practice at the centralized waste storage facility at RFETS.
- Hardened Concrete Vault - Waste in cargo containers would be placed in an above grade freestanding concrete structure. The floor of this structure would serve as a secondary containment system. This is a current practice at the DOE Savannah River Site.

All of the alternatives except No-Action, would provide handling and shipping capabilities for offsite transport. A summary of the alternatives analysis using the seven RFCA criteria is presented in Table 4-1. The following text discusses each of the alternatives.

The No Action Alternative was rejected because it would not support timely risk reduction for the following reasons:

- The current permitted storage capacity at RFETS would not likely support storage for the waste volumes estimated in the Draft Ten Year Plan in the event offsite shipment cannot keep pace with generation thus delaying cleanup

- Near-term costs for risk reduction activities could increase because additional resources might be needed sooner to meet land disposal restriction treatment requirements. This would delay the number of source removals that could take place in a given time frame.

- If risk reduction activities do not occur in a timely fashion, more resources will be necessary to continue maintenance, monitoring, and inspection for areas not cleaned up, which limits the resources that can be applied towards actual risk reduction.

The Slab On Grade alternative was rejected because this design is not as protective of human health and the environment as other storage alternatives. This alternative would not protect the waste containers from corrosion due to the weather, or contaminants from dispersal by the wind if containers leaked. Waste containers may be exposed to the environment for unknown duration due to the uncertainties associated with offsite disposal resources. This would increase costs for maintenance, monitoring, and inspection. For these reasons, this alternative would not as adequately address worker safety; protection of public health and the environment; or facility design, containment and monitoring criteria as well as the Hardened Concrete Vault or Metal Building alternatives.

The Hardened Concrete Vault was rejected primarily due to cost. It would adequately address worker safety, protection of public health and the environment, and containment requirements. For short-term storage, it would not provide any more protectiveness than the Metal Buildings. If the facility needed to be utilized for more than 30 years, the Hardened Concrete Vault might be the best alternative. However, the CSF facility is intended for short-term use only (as described in the Draft Ten Year Plan strategy). The added durability of the Hardened Concrete Vault, therefore, was not a factor in the selection process. The Hardened Concrete Vault also might not offer the flexibility needed for changing waste volumes or transportation requirements. Once constructed, the facility would be difficult to reconfigure. When the facility is no longer needed, its closure would be more complicated and costly than the other alternatives since by design, this type of structure is more permanent by design.

The Metal Buildings alternative was selected as the best alternative for short-term storage (10-20 years). The Metal Buildings would provide adequate protectiveness at a lower cost. Other advantages that Metal Buildings offer include:

- Containers would be protected from the elements and potential airborne dispersal should any of the containment units fail. Air monitoring could be incorporated into existing programs.

- The use of a modular building design allows flexibility in addressing changing storage requirements, i.e. buildings could be constructed as needed.

- The level of containment would be protective of workers, the public, and the environment. The combination of strong tight containers, an enclosed building, a leak collection system, and secondary containment would provide protectiveness to surface water and ground water.

- Metal buildings would offer the same protection as more sophisticated designs, and at a lower cost. The use of pre-engineered buildings would further reduce cost and expedite the schedule. Lower costs allows more resources to be directed towards risk reduction activities.

- Use of the Metal Buildings alternative for the storage of waste is an established and implementable technology currently in use at RFETS and elsewhere.

- Closure of the facility would be less complicated and more cost effective than the hardened concrete vault.

Table 4-1 Summary of Analysis of Alternatives

RFCA CRITERIA				
Final Design Alternatives	**Worker Safety**	**Protection of Public Health and the Environment**	**Transportation**	**Facility Design, Containment and Monitoring**
No Action	Waste would need to be immediately shipped in bulk to reduce exposure. Potential cleanup schedule might be impacted. Exposure could result if waste leaked from containers.	Visual inspections would allow leaks to be detected before release to the environment. However, Exposed containers could eventually pose a risk. Lack of adequate storage capacity could delay some remediation work.	The necessity of immediate shipping could limit transportation options and cleanup schedules. Loading and unloading could be hampered by the lack of a waste handling facility.	Waste will not be consolidated. Sources may not be continued in a timely fashion.
Slab on Grade	Exposure via wind dispersal could result if waste leaked from containers. Construction of the facility poses minimal risk. More maintenance on containers would be needed.	Visual inspections would allow leaks to be detected before release to the environment. Containerized waste would be stored uncovered prior to shipment. Exposed containers could eventually pose a risk to the human health and the environment, if not maintained.	The Slab on Grade would facilitate transportation. Facility could double as a loading and unloading facility. Facility could be accessed from many different sides. Facility would not be expected to have a detrimental impact to traffic flow onsite. Shipping could be required through several population centers.	Containers and structure would be exposed to the elements which could accelerate deterioration and leakage. The slab itself is a containment and collection system. Exposed contaminants could be subject to airborne migration.
Metal Buildings	Waste would be isolated from workers. Construction of the facility poses minimal risk. Less container maintenance would be needed.	Visual inspections would allow leaks to be detected before release to the environment. Waste containers would be sheltered from the elements.	The CSF would allow coordination of transportation and more transportation options for offsite shipment. CSF would double as a loading and unloading facility. Facility is not expected to have a detrimental impact to traffic flow. Shipping could be required through several population centers.	Secondary containment would be incorporated into the building design. Monitoring would be accomplished through visual inspection and secondary containment system.
Hardened Concrete Storage Vault	Waste would be isolated from workers. Construction of the facility poses minimal risk. Destruction and decommissioning of facility would be more difficult than other alternatives.	Visual inspections would allow leaks to be detected before release to the environment. Vault would provide better long-term protection than other alternatives. Waste containers would be sheltered from the elements.	Access to facility would be more limited. Facility would not be expected to have a detrimental impact to traffic flow. Shipping could be required through several population centers.	Secondary containment would be incorporated into the building design. Monitoring would be accomplished through visual inspection and secondary containment system.

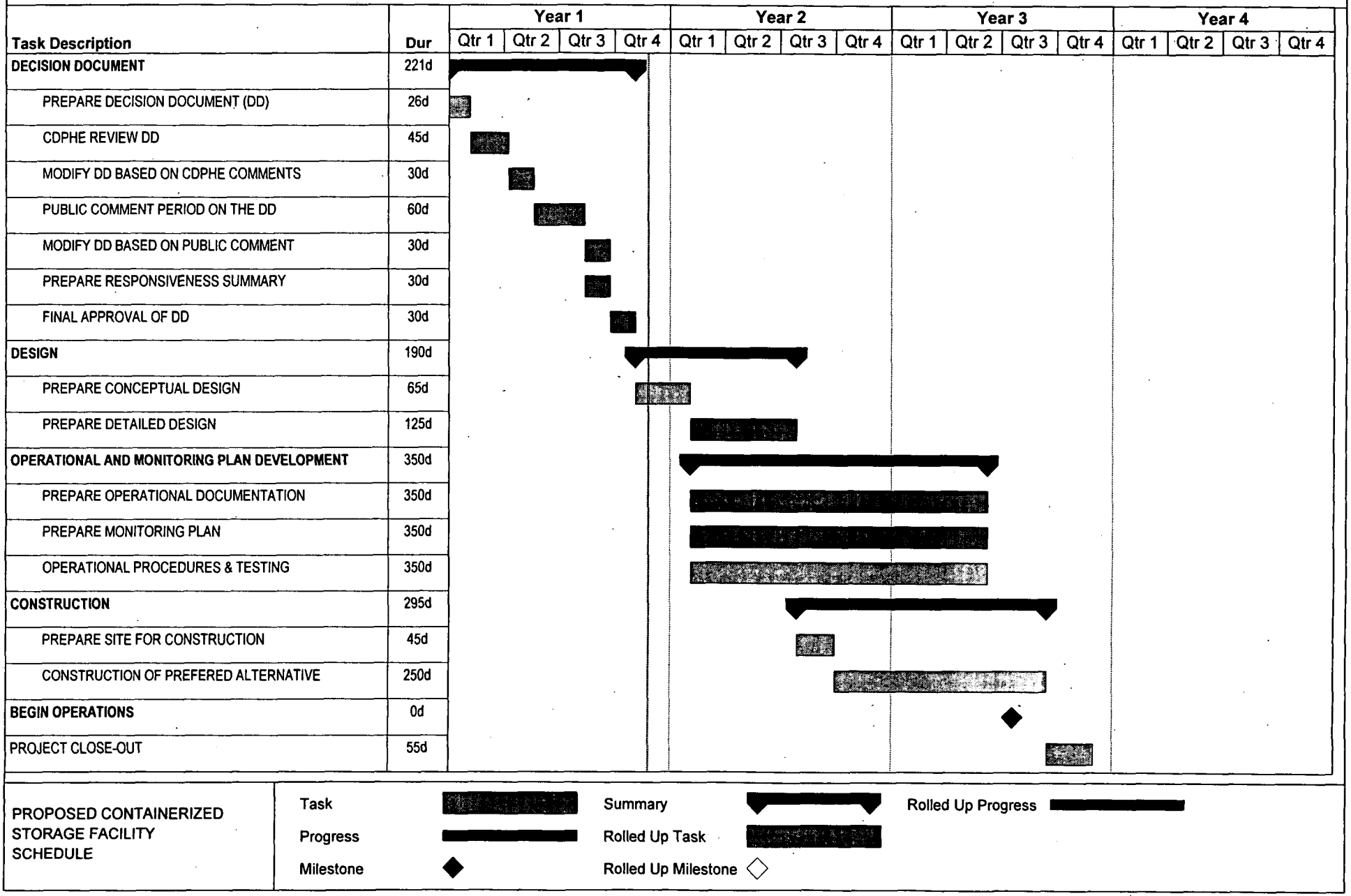
7. REFERENCES

DOE, 1996a, *Final Rocky Flats Cleanup Agreement*, July 19.

DOE, 1996b, *Draft Ten Year Plan*, July 30.

Kaiser-Hill, 1996, Hazard Categorization Analysis for Waste Management Facility, January.

FIGURE 6-1: PROPOSED CONTAINERIZED STORAGE FACILITY SCHEDULE



6. SCHEDULE

In Paragraph 109 of RFCA, subparagraphs (b) and (c) durations for the CSF CAMU designation process are given as such:

> "b. Within 45 days of receipt of DOE's draft IM/IRA, CDPHE shall determine that the IM/IRA meets or fails to meet the criteria in subparagraph (a). If CDPHE determines that the draft fails to meet the criteria, it shall, at the end of its 45 day review, explain with specificity the necessary modifications and allow Doe to resubmit within 30 days or to invoke dispute resolution within 14 days. If CDPHE determines that the application meets the criteria described in subparagraph (a) , it shall issue the draft IM/IRA for public comment for a period of 60 days.
>
> c. Within 30 days of the close of the public comment period, CDPHE shall review the comments received and modify the draft if appropriate. The agency shall also prepare a response to significant public comments at this time. At the end of this 30 day period, if CDPHE still agrees that the IM/IRA as modified meets the regulatory criteria for designation and the criteria in paragraph 80, CDPHE shall designate the storage CSF CAMU. If CDPHE has determined that the IM/IRA does not meet these same criteria, it shall state the changes that DOE must make to receive approval".

Once the CSF CAMU designation is complete, design and construction of the facility would occur only as a contingency action and would take a little more than two years (Figure 6-1). The facility would then be tested and opened for use. Placement of remediation waste in the facility would be dependent on the progress of decommissioning and remediation activities. The schedule for eventual shipment of the waste offsite has not been determined; nonetheless the Draft Ten Year Plan assumes that all low level mixed waste would be disposed offsite by the year 2007.

Additional requirements addressed in the WAC or Facility Operations Plan for compliance would be administrative controls. The following requirements would ensure the CSF to be operated in a safe manner:

- Recordkeeping and documentation;
- Waste information from process knowledge and/or sampling and analysis data for waste characterization;
- Quality assurance/quality control (QA/QC) certification program and verification;
- Status reports and waste forecasts;
- Shipment notification;
- Packaging and labeling requirements.

5.6 CONCLUSION

The CSF is proposed as a contingency to meet the accelerated risk reductions described in the Draft Ten Year Plan. The Draft Ten Year Plan assumes remediation waste can be shipped offsite at the same rate it is generated. The CAMU is proposed to address the contingency that offsite waste shipment and disposal are not available when the wastes are generated.

5.5 CONTAINERIZED WASTE STORAGE FACILITY OPERATIONS

The CSF would be operated and maintained under a number of administrative requirements, as previously mentioned in section 5.3 "Technical and Administrative Controls," to ensure compliance with paragraph 80 of RFCA. Administrative controls would be administered for activities of waste operations in the following areas:

- WAC documents and forms - These would be required to demonstrate compliance with the CSF WAC and paragraph 80 of RFCA requirements previously mentioned in section 2.2;
- Operating procedures - Procedures for handling and placement of waste, facility maintenance and documentation to ensure safe and efficient operation of CSF;
- Training plan - A plan to administer required training for operating personnel in procedures, safety, and quality assurance;
- Health & Safety Plan - The health and safety requirements for operating personnel to conduct operations in a safe manner;
- Contingency/spill response plan would define, per Subpart 264.304, how the facility would respond to a release of waste or constituents from the CSF;
- Limiting operating conditions - Identification of abnormal events which would require operations to temporarily stop activities (e.g. excessive wind velocities, and other weather conditions) to ensure safety to the public, the workers, and the environment
- Administrative procedure and plans - Additional procedures and plans to ensure compliance with RFCA, DOE orders, and RFETS rules and policies;
- Control of fugitive dust emissions - Facility Monitoring Plan as cited in section 5.3 to reduce dust emissions and monitor results to protect the public and worker; and
- Closure Plan - This would include the requirements and performance standards for closure per Subpart G and 264.552 (e) to close the facility after the end of its operational life.

Document and review process would satisfy the documentation and procedural requirements of the RFCA. The National Environmental Policy Act (NEPA) process was integrated into the RFCA documentation and procedure, especially public involvement and decision-making, to reduce duplication and paperwork, and streamline the combined NEPA/CERCLA/RCRA process. In accordance with the DOE Secretarial Policy issued in June 1994, integrated CERCLA/RCRA documents for environmental clean up activities are to incorporate NEPA values to the extent practical. This policy is intended to minimize the cost and time for document preparation and review while meeting the requirements of both acts.

The CSF would be anticipated to minimize cumulative effects on the environment by being placed in the Western Industrial Area because of the following:

- The proposed area in the industrial area has been already disturbed and consolidation of waste is achieved;
- Existing infrastructure already exists which would support the CSF; and
- The proposed area was selected based on a detailed siting study which screened out sensitive areas (e.g. areas populated by the rare species, the Prebles Jumping Mouse, steep slopes, wetlands, etc., were avoided).

The analyses required by NEPA has been integrated throughout the decision process. Based on the analyses, the decision-making process requires no further documentation to complete the NEPA process.

5.4.1 ANTICIPATED DAMAGES TO NATURAL RESOURCES

The alternatives analyzed, excepting the No Action alternative, would not result in irreversible damage to natural resources because releases to the environment would be averted through the use of double containment and leachate collection systems for waste storage preceding shipment. In addition, none of the alternatives analyzed will result in irreversible and irretrievable damages to natural resources because the remediation waste stored in the proposed CSF CAMU is to be shipped offsite to a disposal facility. If, at some point in the future, a proposal is advanced to use some portion of the CSF CAMU for disposal, the impact upon natural resources resulting form such a use would be analyzed at that time.

- An operational health and safety plan approved by the agencies designed to provide operational constraints for personnel protection, weather conditions, decontamination procedures, training requirements, emergency response, and health and safety monitoring;
- Standard operating procedures that establish clear, repeatable, guidelines for conduct of operations, including packaging and transporting of waste from decommissioning activities or IHSS remediation locations to the CSF;
- Numerous quality assurance procedures from construction quality assurance, to procedural audits, all designed to ensure the facility and operations meet designated performance standards;
- Closure plans that define how the facility would be decommissioned after the life of the operations and the performance standards for closure per 6 CCR 1007-3 Part 264, Subpart 264.310 and 264.552(e); and
- Contingency/spill response plans would define how the facility responds to a release of waste or constituents from the CSF.

Administrative Controls - Administrative controls are defined to ensure that risk of exposure during construction, operations, and closure are minimized. These may include:

- Appropriate institutional controls (e.g. warning signs, fences);
- Security plans which define site restriction requirements throughout the life of the project; and
- Cleanup standards which define the level of cleanup necessary to certify closure.

In summary, numerous technical and administrative controls would be in place to insure that all aspects of this effort were conducted in such a way that risks to human health and the environment would be minimal.

5.4 NEPA VALUES

The proposed CSF would be authorized using a single, integrated Decision Document that would be signed by the DOE and the State of Colorado when approved. The Decision

- Engineering Controls (leachate collection/detection system);
- Facility Monitoring (e.g. groundwater monitoring plan);
- Operational Controls (e.g. waste acceptance criteria, visual inspection, Health and Safety plan, contingency/spill response plan); and
- Administrative Controls (e.g. limited access; institutional controls).

Engineering controls - There would be specific engineering controls designed into the facility in order to support protection of human health and the environment throughout the operational life of the facility. The following engineering controls for the CSF are:

- Double containment (e.g., containers and secondary containment by concrete floor slab);
- Leachate collection/removal is an integral collection/removal system constructed in the floor slab with sumps and piping; and
- An internal infrastructure designed to facilitate retrieval of wastes.

Facility Monitoring - An extensive monitoring network would ensure no releases pass undetected from the unit boundary. This would include both air and surface water monitoring stations and groundwater monitoring wells upgradient and downgradient of the CSF. A groundwater monitoring plan would be developed. These requirements would also be integrated into the overall RFETS monitoring program to ensure that a comprehensive network was in place to help protect human health and the environment.

Operational Controls - Operational controls would be put in place to ensure that waste management operations were conducted in such a way as to minimize the risk of release from the facility or exposure to personnel:

- An agency-approved waste acceptance criteria specifying a safety envelope for chemical and physical waste parameters including appropriate treatment requirements;

5.2.6 Health and Safety Issues

The primary health and safety concerns for the CSF are itemized as follows:

- Operations involving heavy equipment (e.g. large forklifts/cranes) for the handling of containers;
- Health and safety issues for the industrial worker;
- Threshold limits of radionuclides for the CSF; and

The CSF would require operating and administrative procedures for the assurance of safe operations involving heavy equipment and protective measures for the industrial worker.

The WAC would address the following radiological requirements:

- Radiological analyses for characterization; and
- Threshold limits of radionuclides for the CSF.

The majority of low-level remediation waste to be managed at the CSF would have an average radionuclide activity less than ten nanocuries per gram (nCi/g) as mentioned previously under section 5.2.1. A preliminary hazard category analysis was performed for the CSF. The CSF was categorized as less than a Category 3 facility and designated as a Radiological Non-nuclear Facility based on preliminary threshold quantities of plutonium and other radioactive isotopes (Kaiser-Hill, 1996). This categorization analysis was based on sampling data from some of the more radioactive IHSSs at RFETS (e.g., 903 Pad and Lip Area, and the Original Process Waste Lines). To be conservative in the hazard analysis, the highest activity concentrations were used from these IHSSs.

5.3 Technical and Administrative Controls

Technical and administrative controls would be implemented in order to ensure that human health and the environment would be protected from areas where present or past activities preclude unrestricted access or use. Discussion of these controls for the CSF are grouped into four major elements and meet the requirements in RFCA paragraph 80:

The WAC would provide physical and chemical limitations and requirements for the proper management of remediation waste. Process knowledge and/or chemical and radiological analyses would become the tools to document accurate characterization of the remedial waste.

5.2.4 Physical Requirements

A summarized list of physical requirements which the WAC would address are listed below:

- Physical properties of bulk wastes such as soils, sediments, and treated sludge (e.g. maximum size range, specific weight, moisture content);
- Physical properties of wastes classified as debris (e.g. maximum size range, specific weight, moisture content, non-biodegradable);
- No free liquids (e.g. 6 CCR 1007-3 Subpart N 264.314; EPA Paint Filter Test);
- Conditions for filled and emptied containers (6 CCR 1007-3 Subpart N 264.315); and
- Prohibitions of containerized gases, ignitable or reactive wastes (6 CCR 1007-3 Subpart N 264.312, 313).

5.2.5 Chemical Requirements

A summarized list of chemical requirements which the WAC would address are listed below:

- Chemical analyses, acceptable analytical methods, and detection ranges;
- Prohibited constituents and chemical characteristics including reactive or ignitable substances (e.g. pyrophoric uranium; 6 CCR 1007-3 Subpart N 264.312);
- Prohibition of incompatible waste (6 CCR 1007-3 Subpart N 264.313);
- pH limitations; and

  Composition of wastes.

1. These waste volumes have an error range of -50% to +100% based on available data.

The actual volume of soil defined by the Tier I and Tier II in RFCA Action Levels and Standards Framework could be larger or smaller because volume estimates were made using preliminary data from limited characterization.

5.2.3 Conceptual Waste Acceptance Criteria

The purpose of the CSF is to provide ER and Decommissioning activities the services of a staging facility for the receiving, interim storage, and ultimate shipping of remediation waste. WAC would be developed for the CSF to ensure remediation wastes comply with applicable regulatory and site requirements. The CSF would accept remediation waste in transportable containers which have accompanying documentation that meets the waste acceptance criteria of the anticipated target disposal facility. The WAC would be specific for the CSF and may not address specific requirements as required by other offsite disposal facilities which ultimately would receive the waste. For criteria which can be quantified, specific levels would be identified.

The following objectives would be achieved in compliance with the WAC:

- Remedial wastes are effectively isolated from potential natural environmental pathways to protect the public health and the environment;
- Operating personnel of the CSF ensure continuous protection to the public health and the environment;
- Remediation waste is routinely monitored and inspected; and
- Characterization data of the remediation waste is documented to the extent necessary to support project specific waste management objectives and WAC requirements for the CSF.

As previously mentioned, the CSF would receive remediation waste from ER and decommissioning activities which would be handled as bulk wastes in customized cargo containers versus crates or drums. The CSF **is not** a handling facility and is not intended to repackage waste once received.

Remediation waste types for the CSF are expected to include the following:

- Contaminated soil collected from remedial actions, usually treated to remove volatile organics;
- Treated and untreated sludge and sediments;
- Toxic Substance Control Act waste (such as asbestos and PCBs);
- Treatment by-products from groundwater, surface water, and/or soil remediation actions;
- IDM from characterization activities, such as wells and borings, if the IDM is characterized as hazardous, low-level, or low-level mixed remediation waste;
- Decommissioning waste which has been characterized as hazardous, low-level, or low-level mixed waste. Decommissioning includes all wastes generated after deactivation. This waste would include contaminated building rubble, equipment, protective equipment, and utilities .

5.2.2 Remediation Waste Volume

Waste volume estimates were based on planned risk reduction activities. A preliminary estimate of remediation waste volumes that may require storage prior to ultimate disposal is presented in Table 5-2 below. The total volume of remediation waste is estimated to be 123,200 cu yd (94,000 cubic meters) which would be placed in the CSF. These estimates were based on current information and were obtained from the Draft Ten Year Plan waste volumes. These volume estimates are not intended to limit the size of the facility, but serve as a tool for the decision making process.

Table 5-2 Remediation Waste Volumes for the Containerized Storage Facility

Remediation Waste Types	Total Estimated Volume (m^3)	Total Estimated Volume (cu yd)	Volume Ranges (m^3)
Low-Level Waste	40,716	53,293	32,573 m^3 to 81,432 m^3
Low-Level Mixed Waste	53,438	69,945	42,750 m^3 to 106,876 m^3
Total[1]	94,000	123,200	75,323 m^3 to 188,308 m^3

Notes:

Notes:
1. A 25% contingency cost is included in the estimate.

The integral leachate collection and retrieval system built into the concrete floor would collect any potential leachate which would be transferred to a facility for treatment.

5.2 WASTE CHARACTERISTICS AND CONCEPTUAL WASTE ACCEPTANCE CRITERIA

The following sections describe the waste and associated acceptance criteria for the CSF. Section 5.2.1 gives a brief identification of the waste characteristics which could be received at the CSF. Section 5.2.2 gives estimates of the waste volumes and section 5.2.3 briefly explains what the Waste Acceptance Criteria (WAC) would address for the CSF.

5.2.1 Remediation Waste Characterization

This section describes the general waste types characteristics which may be placed in the CSF. Identification of waste characteristics, sources and projected volumes for the CSF clarify and substantiate the need for a contingency to existing waste storage. Only remediation and decommissioning waste would be considered for management in this facility.

Remediation waste is defined as follows by RFCA, part 5, line 26, item (b.f.):

> (1) solid, hazardous, and mixed wastes; (2) all media and debris that contain hazardous substances, listed hazardous or mixed wastes or that exhibit a hazardous characteristic; and (3) all hazardous substances generated from activities regulated under this Agreement as RFCA corrective actions or CERCLA response actions, including decommissioning. Remediation waste does not include wastes generated from other activities. Nothing in this definition confers RCRA or CHWA authority over source, special nuclear, or byproduct material as those terms are defined in the Atomic Energy Act.

In addition, low-level waste, as defined by RFCA, is radioactive waste that is not high-level waste, spent nuclear fuel, by-product material, or transuranic waste (although it may contain small amounts of transuranic elements). The majority of the low-level waste managed at the CSF would have an average radionuclide activity less than ten nanocuries per gram (nCi/g) based on the Hazard Categorization Analysis (Kaiser Hill, 1996a).

met will be submitted during the design phase

The following features were used to develop a conceptual cost estimate (see Table 5-1):

- Four metal buildings, each 570 ft. long by 130 ft. wide and 20 ft. eave height;
- Each building would be constructed, when required, dependent upon waste volumes;
- Buildings would be constructed over a reinforced concrete floor;
- A maximum storage capacity total of 5,000 - 20 cu yd cargo containers for the entire four building CSF;
- Cargo containers would be stacked three high in the buildings;
- Each building would have a thirty foot wide central corridor and personnel access aisles for routine monitoring and inspection;
- A twenty-year design life ;
- 20,000 cargo containers; and
- Groundwater monitoring wells (six total maximum) would be installed both up gradient and down gradient and would be monitored through the life cycle of the CSF (20 years).

TABLE 5-1 SUMMARY OF COSTS FOR THE CSF

TASK DESCRIPTION	ESTIMATED COST
Containers	$68,177,000
Site Preparation	$ 1,209,000
Engineering Design / Project & Const. Mgmt.	$ 3,685,000
Construction	
A. Four Metal Buildings	$ 9,307,000
B. Leachate Collection/Detection System	$ 35,000
Total Cost [1]	**$82,413,000**

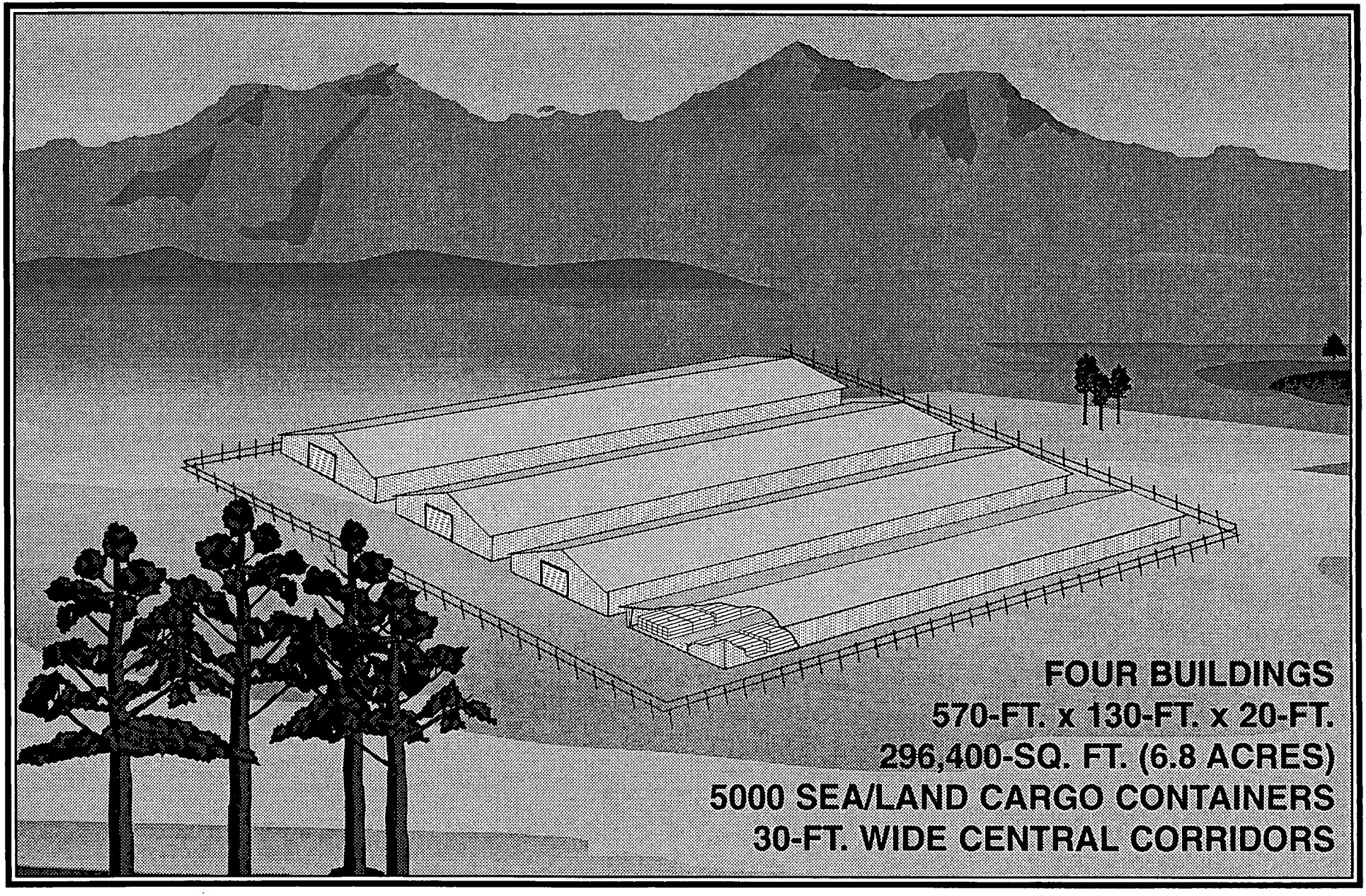


Figure 5-2

CONTAINERIZED STORAGE FACILITY

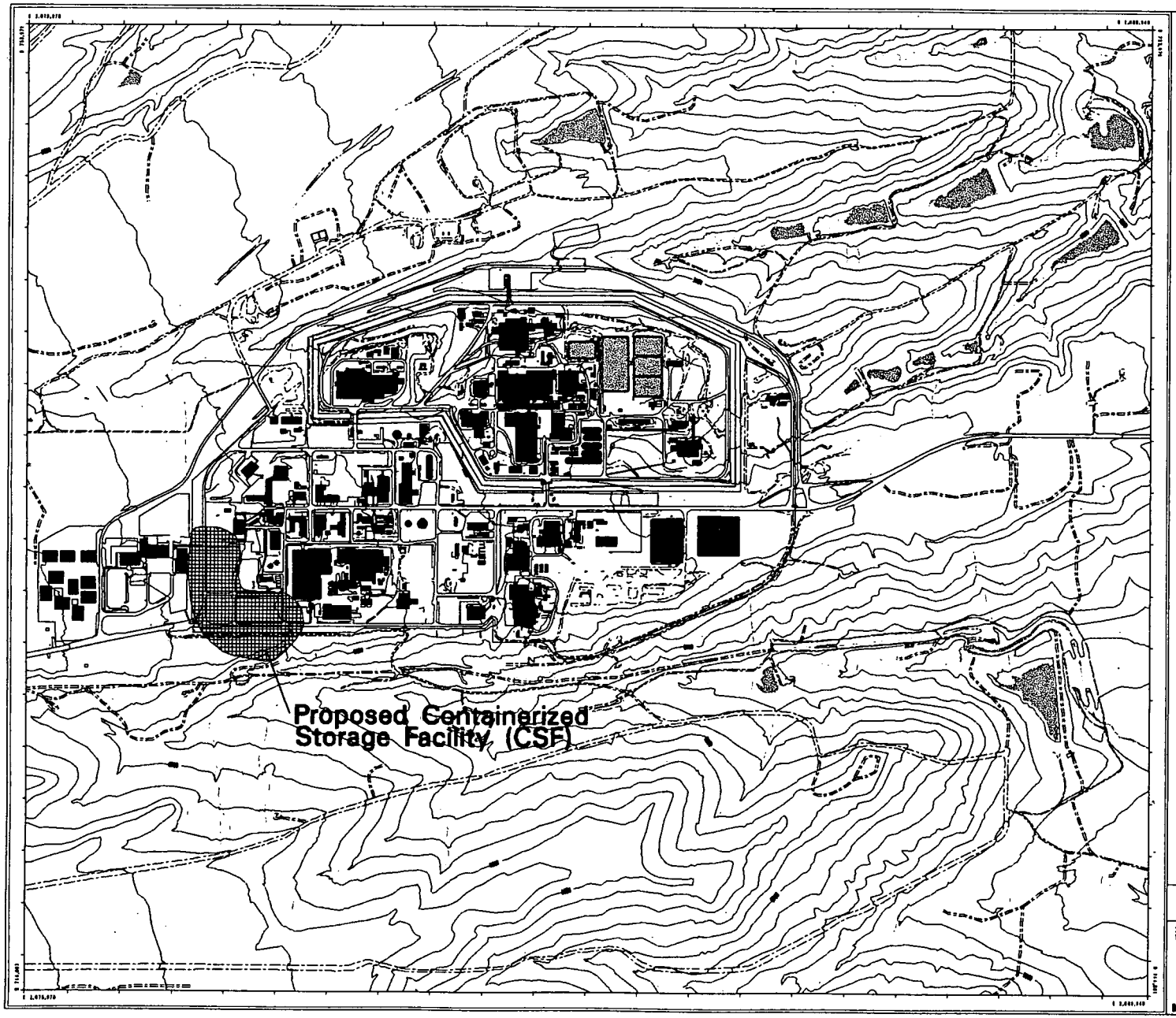


Figure 5-1
Location Map for Containerized Storage Facility (CSF)

EXPLANATION

Containerized Storage Facility (CSF)

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads

DATA SOURCES:
Buildings, roads, and fences provided by [illegible]
[illegible] Rocky Flats, Inc. - 1995.
Hydrology provided by [illegible]
[illegible] - [illegible]

N

Scale = 1 : 17620
1 inch represents approximately 1468 feet

400 0 800 1,600ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
RMRS Rocky Mountain Remediation Services, L.L.C.
Rocky Flats Environmental Technology Site
P.O. Box [illegible]
Golden, CO [illegible]

MAP ID: 97-0009 November 25, 1998

gis\data\rfp-maps\mxd\97-0009.mxd

5. FACILITY DESCRIPTION

This section describes the conceptual design of the CSF proposed for the management of remediation wastes. The CSF is proposed to be located in the southwest corner of the Industrial Area (Figure 5-1). The CSF would be a series of engineered metal buildings, as shown on Figure 5-2, to serve as a staging facility for the receiving, storage, and ultimate shipment of remediation waste. The proposed location benefits from minimal site preparation costs, and the presence of an adjacent rail spur for offsite shipment. A footprint of 6.8 acres would include up to four modular buildings which could store 5,000, 20-cu-yd-capacity cargo containers, for a total capacity of up to 100,000 cy. The modular design would allow the final configuration and storage capacity to be flexible in order to meet changing waste-storage requirements. The metal buildings would be constructed on reinforced sealed concrete foundations. The remediation waste would be effectively isolated from the environment by the following barrier systems:

- Containers; and
- Structural concrete floor slab with integral leak collection system.

The CSF would have a design life of twenty years (e.g. 10 years operation under the Draft Ten Year Plan and operation for an additional 10 years as a contingency) at which time the remediation waste would have been transported to an offsite facility for treatment and disposal.

5.1 RFCA DESIGN CONSIDERATIONS

- RFCA paragraph 80 describes requirements that have been incorporated into the conceptual design such as leachate detection and collection. Details of how these requirements will be

Table 4-1 Summary of Analysis of Alternatives (continued)

Final Design Alternatives	NEPA VALUES SHORT-TERM EFFECTIVENESS	NEPA VALUES LONG-TERM EFFECTIVENESS
No Action	Additional effort would be needed for inspecting waste left at cleanup sites until shipment. The limited ability to store large quantities of waste on site could limit risk reduction activities in the short term.	All offsite disposal facilities under consideration have been designed for long-term use. The No Action alternative would not be effective if it causes significant delay of source term removals.
Slab on Grade	Rapid construction due to modular design would accelerate the availability of the facility. Un-enclosed transport containers could be subject to weather damage. Slab drainage and leachate collection system could be impacted by heavy rains. This alternative would not be suitable for volumes over 100,000 cy, because of space restrictions. Allows timely risk reduction to continue.	Not designed as a long-term facility. No long-term protection. All offsite disposal facilities under consideration have been designed for long-term use.
Metal Buildings	Rapid construction due to modular design would accelerate the availability of the facility. This alternative would not be suitable for volumes over 100,000 cy, because of space restrictions. Allows timely risk reduction to continue.	Not designed as a long-term facility. All offsite disposal facilities under consideration have been designed for long-term use.
Hardened Concrete Storage Vault	Rapid construction due to modular design would accelerate the availability of the facility. Containerized waste storage inside a concrete vault would not be suitable for volumes over 100,000 cy, because of space restrictions. Allows timely risk reduction to continue.	Designed as a long-term, permanent facility to support long-term waste placement.

Table 4-1 Summary of Analysis of Alternatives (continued)

	RFCA CRITERIA		
	Institutional Controls	**Cost**	**Community Acceptance**
No Action	The current RFETS access limitations and procedures would be institutional controls for waste stored at remedial action and D&D sites prior to shipment off site. Each site with waste stored pending shipment would require regularly scheduled inspections. Once shipped, institutional controls would exist offsite; the nature of those institutional controls would be dependent on the selected disposal facility.	Least expensive of alternatives. Some cost savings could be realized by not constructing a storage unit. Delayed source removals could increase inspection and monitoring costs for RFETS.	Waste containers would continue to be exposed to the environment prior to shipment. Supports desire for offsite disposal.
Slab on Grade	RFCA would be an institutional control requiring continued maintenance, inspection and monitoring of the facility. Since the use of the facility is for short-term storage, controls beyond existing controls are not necessary.	Least expensive storage facility to construct and operate at least in the short term. Cost savings come at the expense of protectiveness due to lack of an enclosed facility. Cost higher for maintenance and inspection. Final disposal costs would still apply.	This alternative provides less protective measures to the public than the other two facilities evaluated. The Slab on Grade supports the overall RFETS strategy of offsite shipment. It is easy to retrieve waste and transport it. Supports desire for offsite disposal.
Metal Buildings	RCRA would be an institutional control requiring continued maintenance, inspection and monitoring of the facility. Since the use of the facility is for short-term storage, controls beyond existing controls are not necessary.	Metal Buildings were in the mid-range of costs for the storage facilities evaluated. Final disposal costs would still apply.	The CSF provides better monitoring and retrieval capabilities. The CSF supports the overall RFETS strategy of offsite shipment. It is easy to retrieve waste and transport it. Supports desire for offsite disposal.
Hardened Concrete Storage Vault	RCRA would be an institutional control requiring continued maintenance, inspection and monitoring of the facility. Since the use of the facility is for short-term storage, controls beyond existing controls are not necessary.	Most expensive of the storage facility alternatives to construct due to expense of constructing hardened concrete shell. Less resources would be available for risk reduction. Final disposal costs would still apply. Decommissioning costs higher.	This alternative is protective. Facility is more permanent than other facilities considered but still can support Draft Ten Year Plan goals. Waste is more difficult to retrieve. Closure of this alternative would be more difficult. Supports desire for offsite disposal.